Scientific Inquiry (Nature of Science Unifying Concept A)

Scientific inquiry is the process by which humans systematically examine the natural world. Scientific inquiry is a human endeavor and involves observation, reasoning, insight, energy, skill, and creativity. Scientific inquiry is used to formulate and test explanations of nature through observation, experiments, and theoretical or mathematical models. Scientific explanations and evidence are constantly reviewed and examined by others. Questioning, response to criticism and open communication are integral to the process of science.

By the end of the grade band:		By the end of the grade band, students know and are able to do everything required in earlier grades and:		By the end of grade band, students know and are able to do everything required in earlier grades and:		By the end of grade band, students know and are able to do everything required in earlier grades and:		
K-2		**Grades 3 - 5**		**Grades 6 - 8**		**Grades 9 - 12**		
N.2.A	**Students understand that science is an active process of systematically examining the natural world.**	**N.5.A**	**Students understand that science involves asking and answering questions and comparing the answers to what scientists know about the world.**	**N.8.A**	**Students understand that scientific knowledge requires critical consideration of verifiable evidence obtained from inquiry and appropriate investigations.**	**N.12.A**	**Students understand that a variety of communication methods can be used to share scientific information.**	
N.2.A.1	Students know how to make **observations** and give descriptions using words, numbers, and drawings. E/S	N.5.A.1	Students know scientific progress is made by conducting careful **investigations,** recording data, and communicating the results in an accurate method. E/S	N.8.A.1	Students know how to identify and critically evaluate information in data, tables, and graphs. E/S	N.12.A.1	Students know tables, charts, illustrations and graphs can be used in making arguments and claims in oral and written presentations. E/S	Using Data
		N.5.A.2	Students know how to compare the results of their experiments to what scientists already know about the world. I/L					
		N.8.A.3	Students know how to draw **conclusions** from scientific **evidence**. E/S	N.8.A.2	Students know how to critically evaluate information to distinguish between fact and opinion. E/S	N.12.A.2	Students know scientists maintain a permanent record of procedures, data, analyses, decisions, and understandings of scientific investigations. I/S	Record-keeping
		N.5.A.4	Students know graphic representations of recorded data can be used to make predictions. E/S	N.8.A.3	Students know different explanations can be given for the same evidence. E/S	N.12.A.3	Students know repeated experimentation allows for statistical analysis and unbiased conclusions. E/S	Accuracy
N.2.A.2	Students know tools can be used safely to gather data and extend the senses. I/L	N.5.A.5	Students know how to plan and conduct a safe and simple investigation. E/S	N.8.A.4	Students know how to design and conduct a controlled experiment. E/L	N.12.A.4	Students know how to safely conduct an original scientific investigation using the appropriate tools and technology. E/L	Safe Experimentation
				N.8.A.5	Students know how to use appropriate technology and laboratory procedures safely for observing, measuring, recording, and analyzing data. E/L			
N.2.A.3	Students know observable patterns can be used to predict future events or sort items. E/S	N.5.A.6	Students know **models** are tools for learning about the things they are meant to resemble. I/S	N.8.A.6	Students know scientific inquiry includes evaluating results of scientific investigations, experiments, observations, theoretical and mathematical models, and explanations proposed by other scientists. E/S	N.12.A.5	Students know models and modeling can be used to identify and predict cause-effect relationships. I/S	Models
		N.5.A.7	Students know observable patterns can be used to organize items and ideas. E/S	N.8.A.7	Students know there are multiple methods for organizing items and information. E/S	N.12.A.6	Students know organizational schema can be used to represent and describe relationships of sets. E/S	